1. A composite tube extending along a longitudinal axis, the composite tube comprising:

a substantially fluid impervious pressure barrier layer,

a composite layer formed of fibers and a matrix, the composite layer and the pressure barrier layer together forming at least a portion of a wall of the tube, the composite layer including a first fiber extending helically relative to the longitudinal axis, a second fiber extending clockwise relative to the longitudinal axis, and a third fiber extending counter clockwise relative to the longitudinal axis, where the first fiber is interwoven with at least one of the second fiber and the third fiber,

an energy conductor extending along at least a portion of the length of the tube, the energy conductor embedded in the wall of the tube, and

a sensor capable of sensing an ambient condition of the tube and communicating a signal based on the sensed ambient condition to the energy conductor, the sensor coupled to the wall of the tube.

2. The composite tube of claim 1, wherein the sensor is integrally formed with the energy conductor.

3. The composite tube of claim 1, wherein the sensor is disposed within the wall.

4. The composite tube of claim 1, wherein the sensor is selected from the group consisting of acoustic sensors, optical sensors, mechanical sensors, electrical sensors, fluidic sensors, pressure sensors, temperature sensors, and chemical sensors.

5. The composite tube of claim 4, wherein the optical sensor is an interferometric sensor.

6. The composite tube of claim 4, wherein the optical sensor is an optical intensity sensor.

7. The composite tube of claim 6, wherein the optical intensity sensor is selected from the group consisting of light scattering sensors, spectral transmission sensors, radiative loss sensors, reflectance sensors, and modal change sensors.

8. The composite tube of claim 4, wherein the mechanical sensor is selected from the group consisting of piezoelectric sensors, vibration sensors, position sensors, velocity sensors, strain sensors, and acceleration sensors.

9. The composite tube of claim 4, wherein the electrical sensor is selected from the group consisting of current sensors, voltages sensors, resistivity sensors, electric field sensors, and magnetic field sensors.

10. The composite tube of claim 4, wherein the fluidic sensor is selected from the group consisting of flow rate sensors, fluidic intensity sensors, and fluidic density sensors.

11. The composite tube of claim 4, wherein the pressure sensor is selected from the group consisting of absolute pressure sensors and differential pressure sensors.

12. The composite tube of claim 4, wherein the temperature sensor is selected from the group consisting of thermocouples, resistance thermometers, and optical pyrometers.

13. The composite tube of claim 1, wherein the sensor is embedded in the composite layer.

14. The composite tube of claim 1, wherein the sensor is embedded in the pressure barrier layer.

15. The composite tube of claim 1, wherein the sensor is positioned between the pressure barrier layer and the composite layer.

16. The composite tube of claim 1, wherein the sensor is mounted to the inner surface of the composite tube.

17. The composite tube of claim 1, wherein the sensor is mounted to the exterior surface of the composite tube.

18. The composite tube of claim 1, further comprising:
at least one additional sensor coupled to the wall of the tube and capable of communicating with the energy conductor, the sensor and the at least one additional sensor forming a set of sensors distributed along at least a portion of the length of the energy conductor.

19. The composite tube of claim 18, wherein the sensor and the at least one additional sensor are positioned at different locations in the wall of the composite tube.

20. The composite tube of claim 19, further comprising:
means for forming a second energy conductor embedded in the wall of the tube, the sensor and the at least one additional sensor being connected in parallel between the energy conductor and the means for forming a second energy conductor.

21. The composite tube of claim 1, further comprising:
a second energy conductor embedded in the wall of the tube, and
at least one additional sensor coupled to the wall of the tube and capable of communicating with the second energy conductor.

22. The composite tube of claim 1, wherein the energy conductor extends helically along at least a portion of the length of the composite tube.

23. The composite tube of claim 1, further comprising:
an axially extending second energy conductor embedded in the wall of the tube and disposed diametrically opposite from the energy conductor.

24. The composite tube of claim 1, wherein the second energy conductor is selected from the

group consisting of a hydraulic medium, a pneumatic medium, an electrical medium, and an optical medium.

25. The composite tube of claim 24, wherein the optical medium is an optical fiber selected from the group consisting of single-mode fibers, multimode fibers, or plastic fibers.

26. The composite tube of claim 1, wherein the pressure barrier layer is formed of a material selected from the group consisting of metals, polymers, and metal/polymer composites.

27. The composite tube of claim 26, wherein the pressure barrier layer is a polymer selected from the group consisting of polyvinylidene fluoride, ethylene tetrafluoroethylene, cross-linked-polyethylene, polyamide, polypropylene, urethane, polyethylene, and polyester.

28. The composite tube of claim 1, further comprising:

an inner protective layer formed of fibers embedded in matrix, the inner protective layer being positioned internally of the pressure barrier layer and the composite layer being positioned externally of the pressure barrier layer.

29. The composite tube of claim 1, wherein the tensile strain of the composite tube when spooled on a reel is at least 0.25 percent.

30. The composite tube of claim 1, wherein the modulus of elasticity of the matrix is greater than 100,000 psi.

31. The composite tube of claim 1, further comprising:

an outer pressure barrier layer resisting penetration of fluids into the composite tube, the outer pressure barrier layer being positioned externally of the composite layer and the composite layer being positioned externally of the fluid impervious pressure barrier layer.

32. The composite tube of claim 1, further comprising:

an outer protective layer disposed externally to the composite layer, the outer protective layer providing wear resistance to the composite tube.

33. The composite tube of claim 32, wherein the outer protective layer is of material selected from the group consisting of ceramics, polymers, filled polymers, fiber composites, silicas, fluorinated polymers, and metals.

34. The composite tube of claim 32, further comprising:

an outer pressure barrier layer positioned between the outer protective layer and the composite layer, wherein the composite layer is positioned externally of the fluid impervious pressure barrier layer.

35. The composite tube of claim 34, further comprising:

an inner protective layer positioned internally of the fluid impervious pressure barrier layer.

36. The composite tube of claim 1, further comprising:

an interface disposed at an end of the composite tube and connected with the energy conductor for communicating a signal from the energy conductor to a signal processor.

37. The composite tube of claim 1, wherein the matrix is formed from a material selected from thermosett polymers and thermoplastic polymers.

38. A composite tube extending along a longitudinal axis, the composite tube comprising:

a substantially fluid impervious pressure barrier layer,

a composite layer formed of fibers and a matrix, the composite layer and the pressure barrier layer together forming at least a portion of a wall of the tube, the composite layer including at least some fibers helically oriented relative to the longitudinal axis, the matrix including a modulus of elasticity of at least 100,000 psi,

an energy conductor extending along at least a portion of the length of the tube, the energy conductor embedded in the wall of the tube, and

a sensor capable of sensing an ambient condition of the tube and communicating a signal based on the sensed ambient condition to the energy conductor, the sensor coupled to the wall of the tube.

39. The composite tube of claim 38, wherein the sensor is integrally formed with the energy conductor.

40. The composite tube of claim 38, wherein the sensor is disposed within the wall.

41. The composite tube of claim 38, wherein the sensor is selected from the group consisting of acoustic sensors, optical sensors, mechanical sensors, electrical sensors, fluidic sensors, pressure sensors, temperature sensors, and chemical sensors.

42. The composite tube of claim 41, wherein the optical sensor is an interferometric sensor.

43. The composite tube of claim 41, wherein the optical sensor is an optical intensity sensor.

44. The composite tube of claim 43, wherein the optical intensity sensor is selected from the group consisting of light scattering sensors, spectral transmission sensors, radiative loss sensors, reflectance sensors, and modal change sensors.

45. The composite tube of claim 41, wherein the mechanical sensor is selected from the group consisting of piezoelectric sensors, vibration sensors, position sensors, velocity sensors, strain sensors, and acceleration sensors.

46. The composite tube of claim 41, wherein the electrical sensor is selected from the group consisting of current sensors, voltages sensors, resistivity sensors, electric field sensors, and

magnetic field sensors.

47. The composite tube of claim 41, wherein the fluidic sensor is selected from the group consisting of flow rate sensors, fluidic intensity sensors, and fluidic density sensors.

48. The composite tube of claim 41, wherein the pressure sensor is selected from the group consisting of absolute pressure sensors and differential pressure sensors.

49. The composite tube of claim 41, wherein the temperature sensor is selected from the group consisting of thermocouples, resistance thermometers, and optical pyrometers.

50. A composite tube extending along a longitudinal axis, the composite tube comprising:

a substantially fluid impervious pressure barrier layer,

a composite layer formed of fibers and a matrix, the composite layer and the pressure barrier layer together forming at least a portion of a wall of the tube,

an energy conductor extending along at least a portion of the length of the tube, the energy conductor embedded in the wall of the tube, and

a sensor capable of sensing an ambient condition of the tube and communicating a signal based on the sensed ambient condition to the energy conductor, the sensor coupled to the wall of the tube.

51. The composite tube of claim 50, wherein the sensor is integrally formed with the energy conductor.

52. The composite tube of claim 50, wherein the sensor is disposed within the wall.

53. The composite tube of claim 50, wherein the sensor is selected from the group consisting of acoustic sensors, optical sensors, mechanical sensors, electrical sensors, fluidic sensors, pressure sensors, temperature sensors, and chemical sensors.

54. The composite tube of claim 53, wherein the optical sensor is an interferometric sensor.

55. The composite tube of claim 53, wherein the optical sensor is an optical intensity sensor.

56. The composite tube of claim 55, wherein the optical intensity sensor is selected from the group consisting of light scattering sensors, spectral transmission sensors, radiative loss sensors, reflectance sensors, and modal change sensors.

57. The composite tube of claim 53, wherein the mechanical sensor is selected from the group consisting of piezoelectric sensors, vibration sensors, position sensors, velocity sensors, strain sensors, and acceleration sensors.

58. The composite tube of claim 53, wherein the electrical sensor is selected from the group

consisting of current sensors, voltages sensors, resistivity sensors, electric field sensors, and magnetic field sensors.

59. The composite tube of claim 53, wherein the fluidic sensor is selected from the group consisting of flow rate sensors, fluidic intensity sensors, and fluidic density sensors.

60. The composite tube of claim 53, wherein the pressure sensor is selected from the group consisting of absolute pressure sensors and differential pressure sensors.

61. The composite tube of claim 53, wherein the temperature sensor is selected from the group consisting of thermocouples, resistance thermometers, and optical pyrometers.